

REMARKS/ARGUMENTS

A. Remarks.

Claims 1, 2, 4-20, and 31-43 are pending in the application, of these claims 1, 2, 4-20, and 31-43 stand rejected. Claim 10 has been objected to as being dependent on itself, it has been amended to now depend from claim 9. Claim 11 stands rejected under U.S.C. §101 as being directed to non-statutory subject matter. Claims 1, 11, 31, and 34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Birchak et al. U.S. Patent No. 5,741,962 in view of Matsiev et al., U.S. Patent No. 6,494,079. Claims 2, 4, 12, 14, 32-34, and 41-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. '962 and Matsiev et al. '079 further in view of Kleinberg U.S. Patent No. 6,346,813. Claims 5-8, 15-18, and 35-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. '962 and Matsiev et al. '079 in view of Kleinberg '813 as applied to claim 1 above and further in view of McFarland et al. U.S. Patent No. 6,182,499. Claims 9-10, 19-20, and 39-40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. '962 and Matsiev et al. '079 in view of Kleinberg '813 and McFarland et al. '499 as applied to claim 1 above, and further in view of He et al. U.S. Patent No. 5,798,982. Claims 41 and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. '962 and Matsiev et al. '079 in view of Kleinberg '813, McFarland et al. '499 and He et al. '982, and further in view of Netzer U.S. Patent No. 5,763,781.

B. Response

1. 35 U.S.C. § 101 – Claim 11

Claim 11 stands rejected under U.S.C. §101 as being directed to non-statutory subject

matter. In response, applicants respectfully point out that claim 11 recites “estimating a *value* of a property of the fluid downhole” (emphasis added), which is different from “determining a property of a fluid downhole.” The term “tangible result” is discussed in section 2106(b) of the M.P.E.P., “the process claim must ... produce a real-world result ... means of producing a beneficial result” (emphasis added). Value is defined as “a numerical quantity assigned or computed¹.” The term “result” is defined as “something obtained by calculation or investigation²”. As such, the method of claim 11 clearly recites a process having a tangible result. Moreover, the beneficial aspects of estimating the value recited in claim 11 are included in paragraphs [0005] – [0009] of the application as filed. Reconsideration of this rejection is respectfully requested.

2. 35 U.S.C. § 103(a) – Claims 1, 11, 31, and 34

Claims 1, 11, 31, and 34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Birchak et al. '962 in view of Matsiev et al. '079. Birchak et al. '962 was cited as teaching a resonator, a controller, and a process, Matsiev et al. '079 was cited as disclosing a resonator in contact with a fluid. It was concluded that it would have been obvious to one of ordinary skill in the art to include a resonator in contact with the fluid for measuring fluid composition.

In response, to sustain a rejection under 35 U.S.C. § 103(a) a prima facie case of obviousness must be established. M.P.E.P. § 2142. Establishing a prima facie case of obviousness requires the prior art reference (or references when combined) must teach or suggest all the claim limitations. *Id.* Claim 1 is being amended with this response to include “a monitor for measuring electrical impedance of the resonator”. Claim 11 is being amended to include the

¹ Webster's New Collegiate Dictionary, 1973, Pg. 1292.

step of “measuring the electrical impedance response of the resonator to the actuation.” Support for these amendments can be found in paragraphs [0031] and [0032] of the application as filed. Birchak et al. ‘962 and Matsiev et al. ‘079 do not include chemometrically analyzing the response data and as such do not teach or suggest all claim limitations of claim 1 or claim 11. It is therefore respectfully requested that these references be removed as a basis for the rejection of claims 1 and 11 and their respective dependent claims.

3. 35 U.S.C. § 103(a) – Claims 2, 4, 12, 14, 32-34, and 41-42

Claims 2, 4, 12, 14, 32-34, and 41-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. ‘962 and Matsiev et al. ‘079 further in view of Kleinberg ‘813. Claims 2 and 32 are being cancelled with this paper and claims 1, 11, and 31 are amended with this paper to include the “chemometric” element of claim 2. Thus the rejection of claims 2 and 32 will be addressed here with respect to independent pending claims 1, 11, and 31.

In response, to rely on a reference under 35 U.S.C. § 103(a), the reference must be analogous art. M.P.E.P. § 2141.01(a). “In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.” *Id.* (Citing *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992)). Per its abstract and field of invention, Kleinberg ‘813 concerns “Magnetic resonance techniques, e.g., nuclear magnetic resonance (NMR) and electron spin resonance (ESR)...”, In contrast the field of invention of the present application recites “using a chemometric equation to estimate fluid density, viscosity, dielectric constant, and resistivity from *flexural mechanical*

² *Id.* at 987.

resonator data”. (emphasis added). The claims involve using the electrical impedance of the resonator in combination with chemometric analysis to estimate fluid data. NMR data is not analogous to the claimed subject matter. Thus Kleinberg ‘813 is not analogous art with regard to the pending claims and should be removed as a basis for the rejection of these claims. Birchak et al. ‘962, Matsiev et al. ‘079, and Kleinberg ‘813 therefore do not teach all the elements of these claims or their dependent claims. Reconsideration of this rejection is respectfully requested.

4. 35 U.S.C. § 103(a) – Claims 5-8, 15-18, and 35-38

Claims 5-8, 15-18, and 35-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. ‘962 and Matsiev et al. ‘079 in view of Kleinberg ‘813 as applied to claim 1 above and further in view of McFarland et al. U.S. Patent No. 6,182,499.

In response, the rejected claims all depend from one of claims 1, 11, or 31. As noted above, claims 1, 11, and 31 each recite chemometrically estimating fluid data based on the electrical impedance response of a resonator. The cited references either do not teach using a chemometric equation or are not analogous to applicants’ field. These references are thus inappropriate to support a claim rejection under 35 U.S.C. §103(a). Reconsideration of this rejection is respectfully requested and that that the rejection of these claims be removed.

5. 35 U.S.C. § 103(a) – Claims 9-10, 19-20, and 39-40

Claims 9-10, 19-20, and 39-40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. ‘962 and Matsiev et al. ‘079 in view of Kleinberg ‘813 and McFarland et al. ‘499 as applied to claim 1 above, and further in view of He et al. ‘982. He et al. ‘982 was cited for the proposition it teaches applying a chemometrically estimated property to a Levenberg-Marquardt algorithm to determine a fluid parameter value for the fluid.

In response, He et al. '982 fails to teach or suggest what the other cited references also lack, that is chemometrically estimating fluid data based on the electrical impedance response of a resonator. Thus the addition of He et al.' 982 fails to teach all the elements of the rejected claims. It is therefore respectfully requested that this rejection be reconsidered and removed.

6. 35 U.S.C. § 103(a) – Claims 1, 4-9, and 14-17 (Vogel et al. '209 and Gauthier)

Claims 41 and 42 stand rejected rejected under 35 U.S.C. § 103(a) as being unpatentable over Birchak et al. '962 and Matsiev et al. '079 in view of Kleinberg '813, McFarland et al. '499 and He et al. '982, and further in view of Netzer '781. Netzer '781 was cited for disclosing an apparatus having a mechanical resonator. Netzer '781 however does not teach or suggest the element missing from the other cited references, i.e. chemometrically estimating fluid data based on the electrical impedance response of a resonator. It is therefore respectfully requested that the rejection of claims 41 and 42 be reconsidered and removed.

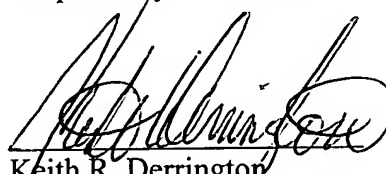
CONCLUSION

Applicants respectfully assert that claim 11 does produce a tangible result and therefore contains patentable subject matter in light of 35 U.S.C. § 101. It is respectfully urged that applicants' claims are patentable in light of the prior art and that the rejections of claims 1, 4-11, 14-20, 31, and 33-43 under 35 U.S.C. § 103(a) be reconsidered and removed. It is believed that the foregoing response is full and complete. Applicants respectfully request reconsideration of the instant application in light of the foregoing response and amendments.

Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of the application, the Examiner is invited to contact the Applicants' representative by telephone or fax.

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Respectfully submitted,



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